POS Motherboard

H1-CPU-Desktop

INTEL CORE 2 DUO E7400
INTEL PENTIUM DUAL CORE E2160
INTEL CELERON 4x0
INTEL CELERON E1500
INTEL CORE 2 DUO E4x00

User Manual

We would like to know your opinion on this publication.

Please send us a copy of this page if you have any constructive criticism.
We would like to thank you in advance for your comments.

With kind regards,

Your opinion:

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User Manual

Edition October 2011

Contents

Introduction

The Motherboard H1 CPU is the next step in the class of BEETLE-Desktop Systems. The benefit is the use of the new Express Chipset Q35 designed for new generation of Intel Microprocessor family called Core 2 Duo (“Conroe” with 65nm-technology” (“Wolfdale” with 45nm “). The two desktop microprocessor cores share the 2MB (or 6MB) L2 cache and communicate over a fast Frontside Bus (800Mhz, 1066Mhz and 1333Mhz) with the chipset. By using the desktop microprocessors the overall cost situation of the BEETLE system is optimized.

The H1 CPU is designed to support the new enhanced functionality of “Active Management Technology (AMT)”. AMT is used e.g. for Software distribution, for remote BIOS updates, remote HW-Diagnostic without running the Operating System.

There is the requirement to mount the H1 CPU into two housings:

1. Existing BEETLE /MII Box for special projects. In this box the microprocessor type Celeron only can be used, because of the thermal situation (max 35W).

2. New BEETLE / MII plus box for all products. In this box the microprocessors of type Core 2 Duo, Core Duo and Celeron are used (max 65W).

In the next chapter please become acquainted with the new components and key features of the motherboard H1 CPU.

Basic Features of H1 CPU

Microprocessors

The following DESKTOP microprocessors of “CONROE” and “ WOLFDALE” technology with Socket LGA 775 are supported:

- INTEL CORE 2 DUO E7400 (65W, CONROE, 65nm)
- INTEL PENTIUM DUAL CORE E2160 (65W, ALLENDALE, 65nm)
- INTEL CELERON 4x0 (35W, CONROE-L, 65nm)
- INTEL CORE 2 DUO E4x00 (65W, CONROE, 65nm)
- INTEL CELERON E1500

Chipset

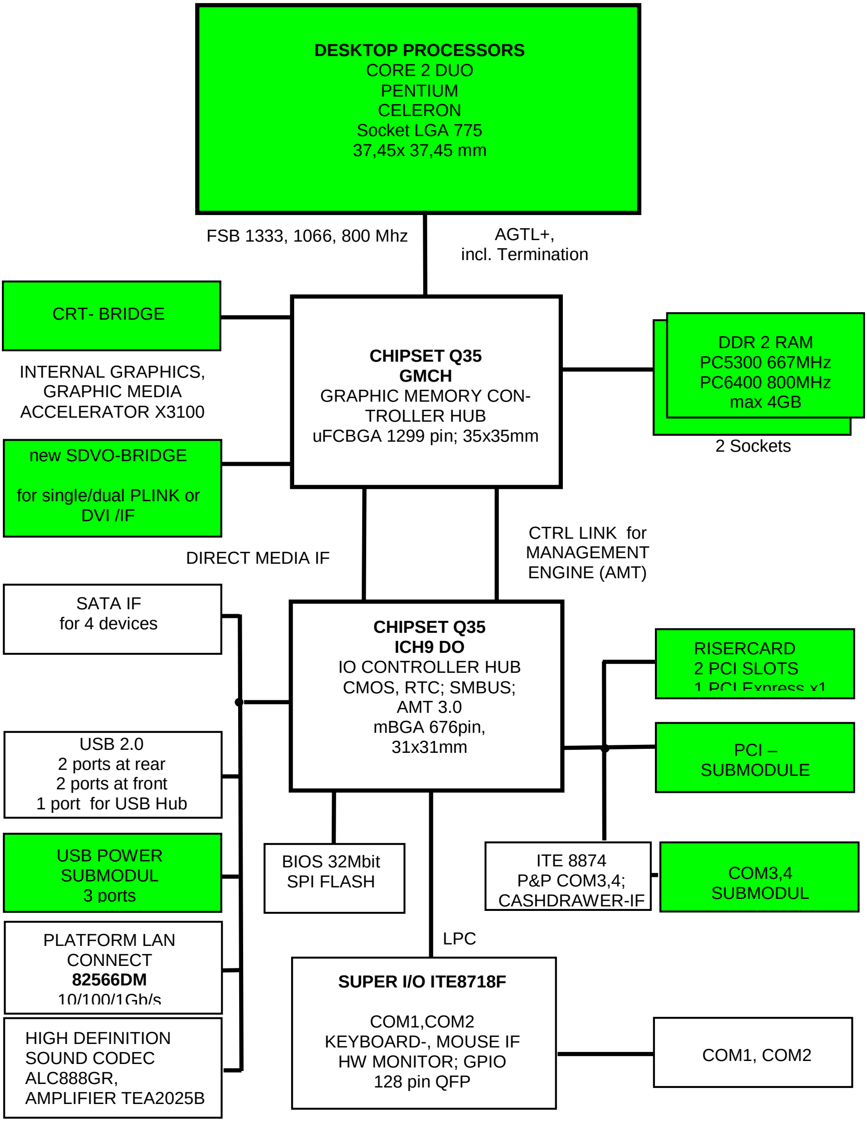
- Platform with chipset Q35 Express
- Chipset with GMCH and enhanced version of ICH9 for AMT (ICH9DO)

Features of the H1 CPU

- HW ready for Active Management Technology AMT 3.0
- Frontside Bus 1333Mhz for Core 2 Duo of “WOLFDALE” type
- Frontside Bus 1066Mhz for Core 2 Duo of “CONROE” type
- Frontside Bus 800Mhz for Dual Core and Celeron of “CONROE-L” type
- Memory Dual Channel mode with two DIMM modules
- Memory Single channel with one RAM DIMM only is possible
- Use of DDR2 RAM Types: PC2 5300 667Mhz or PC2 6400 800Mhz
- Memory size up to 4GB, depends on Operating System; for win XP 3GB
- Enhanced internal graphic with new Graphic Engine GMA 3100

- Serial Peripheral Interface (SPI) Flash 32Mbit for BIOS and AMT functionality
- SATA II 3Gb/s Interfaces
- Gigabit LAN Phy prepared for AMT funktionality 82566DM
- Raid 0/1/5/10
- Super IO ITE 8718F
- High Definition Audio CODEC

Blockdiagram of the CPU



More Features of H1 CPU

- Main Memory min 512MB; max. Main Memory 4GB (XP max. about 3GB)
- 10 USB ports (USB1.1 and 2.0) available , addititional 2 ports reserved
- New SDVO Bridges for dual Panellink- and DVI Interface (changed formfactor)
- Available CRT-Bridge (F2 type) available Risercard with PCI Standard connectors
- Same plugin concept for Power USB sandwich card and COM 3,4 on-board card like E1, F1, F2 type
- Onboard PCI connector for PCI based Plug-in modules: Support of introduced Secondary CRT Controller, Secondary TFT Controller, VGA4 Controller
- Sound Amplifier TEA2025B, same as in F2CPU
- LAN 1GB integrated onboard
- LPT1 Port available
- Prepared for NVRAM module and TPM module
- Risercard with PCI Express x1 Interface (F2 type) or 2x PCI Standard (F2 type)

The following features are not implemented:

- No support of analog DVD Audio
- No support of Floppy disk
- No support of Line In

Attention:

1. Only TFT- displays with DDC (like BA72A-2 and BA73A-2) will be supported (same with available F1-, F2- and G1CPU).
2. H1 CPU need to qualify new RAM´s DDRII with RAM Bus 667Mhz.

No Sealed Box

From the desktop processor types there are no ULV versions available. Therefore the H1 CPU is not able to integrate into the available Sealed Boxes.

Long term Availability

Above mentioned Microprocessors and the chipset Q35 are supported by the INTEL IPD (Infrastructure Processor Devision) “Embedded” Group. In this way the longtime- availability is guaranteed.

Operating Systems/BIOS

The H1-CPU is PC compatible and supports the following operating systems:

- WINXP, WEPOS, WNLPOS, VISTA prepared. Features of PnP, ACPI, DMI are implemented.

The BIOS is based on the Phoenix Core. Customized POS specific functions are implemented. The size of the SPI Flash for firmware incl. AMT support is 32Mbit.

Technical Data

Supported Systems	BEETLE /MII, BEETLE /MII+
Architecture:	PC- compatible with POS -specific functional units
Operating Modes:	Normal Mode, Standby S3, Hibernation
Power Management	ACPI 2.0, APM 1.2
Active Memory Technology	AMT 3.0
Operating Systems:	WIN XP, WEPOS, WNLPOS, VISTA prepared
Microprocessor types	E2160, , E7400, CEL4x0, E4x00
Frontsidebus	1333 MHz, 800 MHz
Microprocessor socket	Socket 775
Chipset:	INTEL chipset Q35 incl. ICH9D0
Memory type	PC2 5300 667Mhz, PC2 6400 800Mhz
Memory Size	Main Memory: max 4GB, size depends on Operating System; max size 3GB for winXP
Memory mode	Dual channel (2 RAM´s needed), Asymmetric mode, Single Channel (1 RAM)
Memory Technology	DDR2, 256Mb, 512Mb and 1Gb technology unbuffered non ECC, height up to 35 mm
Memory Socket	2x DDR2 DIMM sockets, 240 pin
BIOS	SPI Flash 32Mbit

Graphics	Mobile Graphic Media Accelerator X3100 Enhanced performance Dual Independent display Dynamic video memory DVMT 4.0 Unified memory Architecture max Video Memory 384MB Max. Resolution: 2048x1536, 60 Hz
LAN	10/100 Mb/s and 1Gb/s in ICH9DO, PHY 82566DM for AMT functionality
SATA	3 Gb/s SATA II, used 2 Interfaces
RAID	Level 0,1,5,10 support
USB	USB1.1 and USB 2.0; used 10 ports USB1, 2: Standard port connector at rear side, USB 6, 7 Standard at front side (B-MII) USB 11, 12 Standard at front side (B-MII+) USB 8 internal for USB Hub
Super I/O	IT8718F: 2 COM Ports, Keyboard Interface PS/2 Mouse Interface, HW- Monitor
Sound	ALC888 High Definition Audio Codec Mono Microphone Input, Stereo Speaker Output (2 x 1,25 W@ 8 Ohm)
Riser-Card Interface	PCI-Bus (32 bit interface, 33MHz) PCI Express 1.0a, PCIe 1x (One slot)
Battery	3 V Lithium for CMOS, RTC and SIO Type: Sanyo CR2032 , 220 mAh
Wake On feature	Wake On LAN, Wake On MODEM, Wake On Time
Keyboard connection	PC-AT compatible
PS/2-Mouse connection	via Y-cable together with keyboard; optional internal mouse connector
Serial interfaces	COM1, COM2* by SIO IT8718F COM3*, COM4* by IT8874
Loudspeaker	For System beep, AT-compatible, volume control defined by BIOS Setup in three steps: high- , medium- , low volume

Cash Drawer connection	cash drawers interfaces, connection via RJ12 connector at Power supply (only for one cash drawer)
PCI Plug-in card interface	32 bit interface, 33 MHz
Status display connection	LEDs for Power On, BIOS Init and HD activity
Board Dimensions	about 255mm x 210mm

Plug In Cards / Risercards

The following Plug In modules have been developed in the past and are available for H1 CPU.

- SDVO Bridge for Plink
- SDVO Bridge for DVI
- CRT Bridge (same in F2CPU, tbd)
- Secondary TFT Controller
- Risercard with 1x Standard-PCI Interface and 1x PCI express
- Risercard with 2x Standard PCI Interface
- Power USB Module (3x12V) (USB 2.0)
- Power USB Module (2x12V 1x 24V) (USB 2.0)
- COM3*,COM4* Module (E1,F1,F2 type)

The following older Plug In modules shall not be used:

- LAN module (INTEL) as LAN is implemented onboard
- LAN module (REALTEK), WLAN module

Connectors

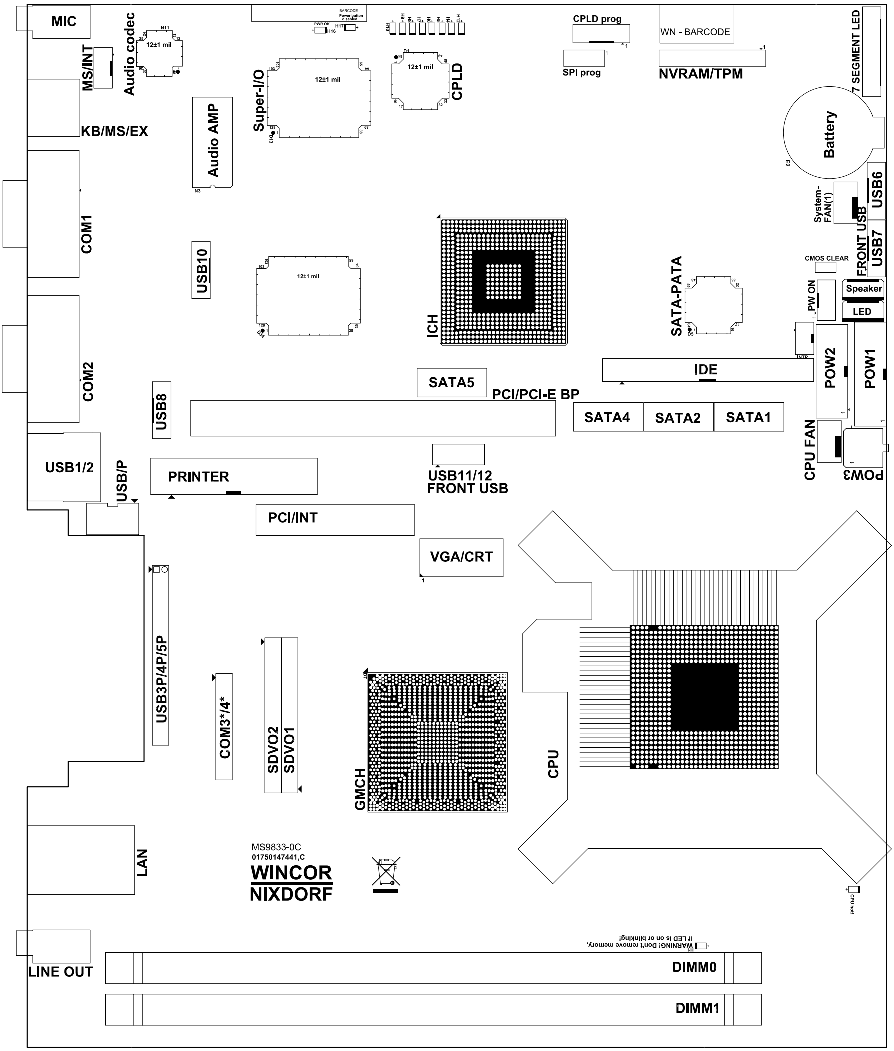
External

Interface	Connector-Type
COM1	9 pin D-sub male
COM2*, COM3*, COM4*	9 pin D-sub female
Keyboard, Mouse	6 pin Mini Din
USB1, 2	Standard Series Stack A
USB3-5	Power USB Connector
CRT (with CRT-Bridge)	15 pin HDD-sub female
TFT (with PLINK Bridge)	40 pin Mini Delta Ribbon
TFT (with DVI Bridge)	DVI –D 24pin
LAN	8 pin RJ45 female
Line Out	3,5 mm female
Microphone	3,5 mm female

Internal

Interface	Connector-Type
DDR2-DIMMs	2 x 240 pin micro edge connector
Harddisk (SATA II)	7 pin Standard SATA header
CRT-Bridge	16 pin Header, 2.54 mm
PLINK- /DVI- Bridge	38 pin Header, 2.54 mm
USB 6-8	1 x 6 pin Header
PS/2-Mouse	4 pin Header, 2.54 mm
Risercard	164 pin connector (PCI Express type)
PCI Onboard	80 pin board to board connector
Speaker	4 pin Dubox Header
PSU	2 x 10 pin Header 2 x 9 pin Header 2 x 5 pin Header 2 x 2 pin Header
Power On	4 pin Header
Status Display	4 pin Dubox Header
Fan 1,2	4 pin Header

Board Layout



Changing the CPU Battery

The BEETLE POS systems are equipped with a lithium battery on the CPU board (see page 10) to ensure data retention, the time and the setup parameters. The battery should be changed approximately every five years.

When inserting the new battery, make sure the polarity is correct. This is marked in the socket. Incorrect replacement of the battery may lead to the danger of explosion.

The battery is located in a ocket in the CPU. To gain access to the battery, proceed as described in the according chapters of your BEETLE **User Manual.**

See:

http://www.wincor-nixdorf.com/internet/site_EN/sid_D0DE5548EA9982007DDA27C7E60D657F.live1/EN/Support/Downloads/POSLotterySystems/Manuals/POS-MB/POS-MB_node.html

The lithium battery must be replaced only by identical batteries or types recommended by Wincor Nixdorf International.
You can return the used batteries to your Wincor Nixdorf International sales outlet.

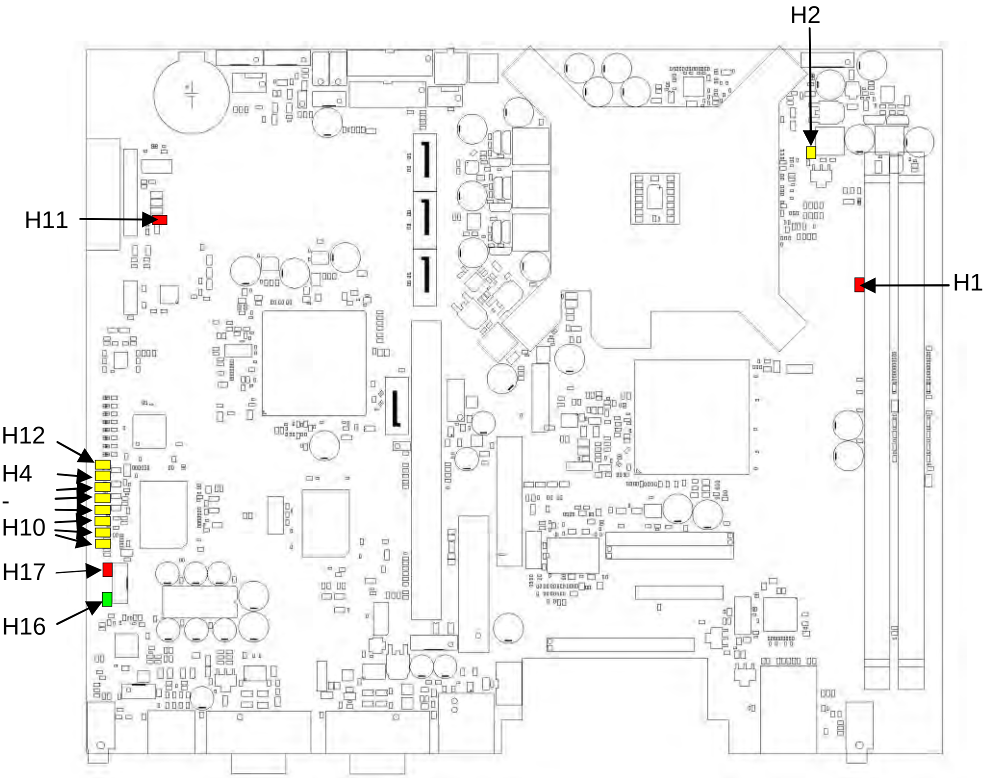
Batteries containing harmful substances are marked accordingly.
The chemical denotations are as follows: CD = Cadmium; Pb = Lead,
Li = Lithium.

This symbol on a battery tells you that batteries containing harmful substances must not be disposed of as household waste. Follow the country specific laws and regulations. Within the European Union you are legally bound to return these batteries to the service organization where you purchased the new battery.

The setup parameters must be reset each time the battery has been changed.

LEDs

Physical arrangement on PCB layout



Overview of LEDs on H1 motherboard

Designator	Color	Signal	Description
H1	red	AMT_LED	AMT status
H2	yellow	PROCHOT#	CPU temperature alert
H12	yellow	I/O 80h	Debug port 80h Bit 0
H4	yellow	I/O 80h	Debug port 80h Bit 1
H5	yellow	I/O 80h	Debug port 80h Bit 2
H6	yellow	I/O 80h	Debug port 80h Bit 3
H7	yellow	I/O 80h	Debug port 80h Bit 4
H8	yellow	I/O 80h	Debug port 80h Bit 5
H9	yellow	I/O 80h	Debug port 80h Bit 6
H10	yellow	I/O 80h	Debug port 80h Bit 7
H11	red	PLTRST	Reset signal

Description of LEDs

H1: AMT indicator LED (red)

The LED H1 is dedicated to AMT functionality. If this LED is blinking the AMT feature is active. AMT activity during different power stats depends on configuration in Intel ME BIOS Extension Menu (press CTRL-P during post). To disable AMT feature plug Jumper X46 or use second DIMM socket near to board edge only.

	AMT disabled by Jumper or DIMM	Configuration in Intel ME BIOS Extension Menu		
		AMT active in S0 only	AMT active in S0, S3	AMT active in S0,S3-S5
S0	on	blinking	blinking	blinking
S3	on	on	blinking	blinking
S4	off	off	off	blinking
S5	off	off	off	blinking

H2: CPU Temperature indicator LED (yellow)

The LED H2 is connected to CPU signal PROCHOT# (processor hot). This signal will go active when the processor temperature monitoring sensor detects that one or more cores have reached its maximum safe operating temperature. In this case LED H2 is on during S0. The LED H2 is also active if the CPU core voltage is off during S0.

H11: Platform Reset indicator LED (red)

The LED H11 is connected to PLTRST# signal coming from Intel ICH9. During reset and sleep states S3-S5 this LED is on.

S0	off
S3	on
S4	on
S5	on

H16: Power OK indicator LED (green)

The LED H16 is connected to Power OK signal coming from Super IO IT8718F. It is a logical combination of ATX Power Good from power supply, VCC power level detection (threshold voltage is around 4V) and the S3 sleep state signal. Therefore in sleep states S3-S5 LED H16 is off.

S0	on
S3	off
S4	off
S5	off

H17: Power Button disabled indicator LED (red)

As a feature of BEETLE motherboards it is possible to configure the After Power Failure item in BIOS Setup Menu to “Follow AC/Power”. In this case the power button connected to X11 on the motherboard is disabled and LED H17 is on during S0.

	After Power Failure item		
	Stay Off	Last State	Follow AC/Power
S0	off	off	on
S3	off	off	off
S4	off	off	off
S5	off	off	off

H4-10, H12: Port 80h status LEDs (yellow)

The H1 motherboard has onboard status LEDs for I/O indication on port 80h. Therefore no additional PCI card for POST debugging is usable. The digit displayed by LEDs is binary coded.

H10	H9	H8	H7	H6	H5	H4	H12
MSB							LSB
Left HEX digit				Right HEX digit			

Example:

LED#	H10	H9	H8	H7	H6	H5	H4	H12
Status	on	off	on	off	on	on	off	off
binary	8	4	2	1	8	4	2	1
decimal	10				12			
hex	A				C			
	Port 80h debug POST code: AC (“TP_SETUP_CHECK”)							

Power up Sequence

After switching on the power supply, following start up sequence should be viewable with BIOS default settings and AMT enabled:

1. H11 (red, Reset) on
2. H2 (yellow, PROCHOT) and fan on
3. H11+H2 off, H16 (green, PWROK) and H1 (red, AMT) on, Port 80h LEDs show 54h
4. H16+H1+Port 80h LEDs off, H11 on, H2 flashes very short again, fan off
5. H1 is off or blinking depending on configuration in Intel ME BIOS Extension Menu (press CTRL-P during post)

Addendum A: Debug port 80h POST Code table

TP_NULL	000h	TP_PDM_INIT	033h
TP_IPMI_INIT	001h	TP_CMOS_TEST	034h
TP_VERIFY_REAL	002h	TP_REG_REINIT	035h
TP_DISABLE_NMI	003h	TP_CHK_SHUTDOWN	036h
TP_GET_CPU_TYPE	004h	TP_CS_REINIT	037h
TP_HW_INIT	006h	TP_SYS_SHADOW	038h
TP_CS_BIOS_DESHAD	007h	TP_CACHE_REINIT	039h
TP_CS_INIT	008h	TP_CACHE_AUTO	03Ah
TP_SET_IN_POST	009h	TP_DBGSRV_INIT	03Bh
TP_CPU_INIT	00Ah	TP_ADV_CS_CONFIG	03Ch
TP_CPU_CACHE_ON	00Bh	TP_ADV_REG_CONFIG	03Dh
TP_CACHE_INIT	00Ch	TP_READ_HW	03Eh
TP_IO_INIT	00Eh	TP_ROMPILOT_MEMORY	03Fh
TP_FDISK_INIT	00Fh	TP_SPEED	040h
TP_PM_INIT	010h	TP_ROMPILOT_INIT	041h
TP_REG_INIT	011h	TP_VECTOR_INIT	042h
TP_RESTORE_CR0	012h	TP_SET_BIOS_INT	044h
TP_PCI_BM_RESET	013h	TP_DEVICE_INIT	045h
TP_8742_INIT	014h	TP_COPYRIGHT	046h
TP_CHECKSUM	016h	TP_CONFIG	048h
TP_PRE_SIZE_RAM	017h	TP_PCI_INIT	049h
TP_TIMER_INIT	018h	TP_VIDEO	04Ah
TP_DMA_INIT	01Ah	TP_QUIETBOOT_START	04Bh
TP_RESET_PIC	01Ch	TP_VID_SHADOW	04Ch
TP_REFRESH	020h	TP_CR_DISPLAY	04Eh
TP_8742_TEST	022h	TP_MULTBOOT_INIT	04Fh
TP_SET_HUGE_ES	024h	TP_CPU_DISPLAY	050h
TP_ENABLE_A20	026h	TP_EISA_INIT	051h
TP_SIZE_RAM	028h	TP_KB_TEST	052h
TP_PMM_INIT	029h	TP_KEY_CLICK	054h
TP_ZERO_BASE	02Ah	TP_USB_INIT	055h
TP_ENH_CMOS_INIT	02Bh	TP_ENABLE_KB	056h
TP_ADDR_TEST	02Ch	TP_1394_INIT	057h
TP_BASERAML	02Eh	TP_HOT_INT	058h
TP_PRE_SYS_SHADOW	02Fh	TP_PDS_INIT	059h
TP_BASERAMH	030h	TP_DISPLAY_F2	05Ah
TP_COMPUTE_SPEED	032h	TP_CPU_CACHE_OFF	05Bh
TP_MEMORY_TEST	05Ch	TP_PM_SETUP	09Ch
TP_BASE_ADDR	05Eh	TP_SECURITY_INIT	09Dh
TP_EXT_MEMORY	060h	TP_IRQS	09Eh
TP_EXT_ADDR	062h	TP_FDISK_FAST_INIT2	09Fh
TP_USERPATCH1	064h	TP_TIME_OF_DAY	0A0h
TP_CACHE_ADVNCD	066h	TP_KEYLOCK_TEST	0A2h
TP_MP_INIT_MIN	067h	TP_KEY_RATE	0A4h

TP_CACHE_CONFIG	068h	TP_ERASE_F2	0A8h
TP_PM_SETUP_SMM	069h	TP_SCAN_FOR_F2	0AAh
TP_DISP_CACHE	06Ah	TP_SETUP_CHECK	0ACh
TP_CUST_DFLT	06Bh	TP_CLEAR_BOOT	0AEh
TP_DISP_SHADOWS	06Ch	TP_ERROR_CHECK	0B0h
TP_ERROR_MSGS	070h	TP_ROMPILOT_UNLOAD	0B1h
TP_TEST_CONFIG	072h	TP_POST_DONE	0B2h
TP_RTC_TEST	074h	TP_ENH_CMOS_STORE	0B3h
TP_KEYBOARD	076h	TP_ONE_BEEP	0B4h
TP_KEYLOCK	07Ah	TP_QUIETBOOT_END	0B5h
TP_HW_INTS	07Ch	TP_PASSWORD	0B6h
TP_ISM_INIT	07Dh	TP_ACPI	0B7h
TP_COPROC	07Eh	TP_SYSTEM_INIT	0B8h
TP_IO_BEFORE	080h	TP_PREPARE_BOOT	0B9h
TP_LATE_DEVICE_INIT	081h	TP_DMI	0BAh
TP_RS232	082h	TP_INIT_BCVS	0BBh
TP_FDISK_CFG_IDE_CTRLR	083h	TP_PARITY	0BCh
TP_LPT	084h	TP_BOOT_MENU	0BDh
TP_PCI_PCC	085h	TP_CLEAR_SCREEN	0BEh
TP_IO_AFTER	086h	TP_CHK_RMDR	0BFh
TP_MCD_INIT	087h	TP_INT19	0C0h
TP_BIOS_INIT	088h	TP_PEM_INIT	0C1h
TP_ENABLE_NMI	089h	TP_PEM_LOG	0C2h
TP_ENABLE_NMI	089h	TP_PEM_DISPLAY	0C3h
TP_INIT_EXT_BDA	08Ah	TP_PEM_SYSER_INIT	0C4h
TP_MOUSE	08Bh	TP_DUAL_CMOS	0C5h
TP_FLOPPY	08Ch	TP_DOCK_INIT	0C6h
TP_AUTOTYPE	08Eh	TP_DOCK_INIT_LATE	0C7h
TP_FDISK_FAST_PREINIT	08Fh	TP_FORCE	0C8h
TP_FDISK	090h	TP_EXT_CHECKSUM	0C9h
TP_FDISK_FAST_INIT	091h	TP_SERIAL_KEY	0CAh
TP_USERPATCH2	092h	TP_ROMRAM	0CBh
TP_MP_INIT	093h	TP_SERIAL_VID	0CCh
TP_CD	095h	TP_PCMATA	0CDh
TP_CLEAR_HUGE_ES	096h	TP_PEN_INIT	0CEh
TP_MP_FIXUP	097h	TP_XBDA_FAIL	0CFh
TP_ROM_SCAN	098h	TP_BIOS_STACK_INIT	0D1h
TP_FDISK_CHECK_SMART	099h	TP_SETUP_WAD	0D3h
TP_MISC_SHADOW	09Ah	TP_CPU_GET_STRING	0D4h
TP_PMCPUSPEED	09Bh	TP_SWITCH_POST_TABLES	0D5h
TP_PCCARD_INIT	0D6h		
TP_FIRSTWARE_CHECK	0D7h		
TP_ASF_INIT	0D8h		
TP_IPMI_INIT_LATE	0D9h		
TP_PCIE_INIT	0DAh		
TP_SROM_TEST	0DBh		

TP_UPD_ERROR	0DCh
TP_REMOTE_FLASH	0DDh
TP_UNDI_INIT	0DEh
TP_UNDI_SHUTDOWN	0DFh
TP_EFI_NV_INIT	0E0h

Addendum B: Sleep States

S0	Normal operation (“On”)
S3	Suspend to RAM / “Stand By”
S4	Suspend to Disk / “Hibernation”
S5	Soft Off

Intel® Management Engine (ME) BIOS Extension Setup

The Intel Management Engine BIOS Extension screen is used to enable and configure Intel® AMT 3.0 or ASF 2.0 on the H1-CPU-Desktop board. Follow the steps below:

1. On rebooting the system, after the initial boot screen, the following message will be displayed: **'Press <Ctrl-P> to enter Intel ME Setup'**.

NOTE: Press <Ctrl-P> as soon as the above message is displayed, as this message will be displayed for only a few seconds.

2. You will be prompted for the password.

3. Enter valid password under 'Intel ME Password' . Press Enter.
(The initial password is "admin")
4. The Intel Management Engine BIOS Extension screen will be displayed.
5. Please refer to "Intel MEBx Settings" (see below) for paper configuring AMT and ME to your needs.

Disabling Intel® Management Engine (ME)

Normal operation of H1-CPU-Desktop assumes to have the ME State Control [Enabled]. If ME is working, it reports its activity by flashing the LED placed between processor and memory modules. If you disable the ME, this LED will light continuously and some functions of Bios may not work correctly as the interface from Bios to ME expects the ME to answer to some requests. In addition, the ME provides the QST that is responsible regulating fan speed. To be sure to avoid thermal overheating due to little fan speed, QST will set PWM to 100% if ME is disabled. But there will be some cases that may need the ME to be disabled. If you like to disable ME you may choose one of three ways:

- Close jumper "AMT disable" (placed near by SATA4 connector)
- Free the DRAM slot DIMM0 that is placed close to processor. If you employ two DRAM modules just remove the module from slot DIMM0. Otherwise move the DRAM module from DIMM0 to DIMM1 (placed near the edge of mainboard)
- Enter the "Intel ME Setup" pressing <Ctrl-P> during POST and select the ME State Control [Disabled].

Notes:

- Do not forget to Re-Enable the ME after temporary disabling.
- If you ever need to re-flash the entire Bios chip (including ME) it is mandatory to have ME disabled! Updating only the Bios may be done with ME enabled.
- If using the wakeup functions of Bios you need to have ME enabled and the ME Power Control covering the correct power states. Otherwise the Bios might not wake up the system or might hang during POST.
- If your system should “hang” during POST due to careless handling, please try the following:
- Switch off the power supply
- Close the “CMOS CLEAR” jumper just for a moment (placed between connectors for System Fan and PWRON)
- Switch on power supply, system will start with total reset of CMOS RAM and Management Engine
- Enter Bios Setup pressing <F2> and select options for Bios
- Enter ME Setup pressing <Ctrl-P> and configure options for ME. The initial password is “admin”
- Should your system not start correctly after this procedure you have to repeat that procedure once more, but additionally remove the button-type battery for 2 minutes after switching off the power supply. Then go ahead as before.

Intel® MEBx Settings

The Main Menu in the MEBx contains the following options:

Setting/Option	**Description / Purpose**
Intel® ME Configuration	Opens the sub-menu for configuring the Intel® Management Engine.
Intel® AMT Configuration	Opens the sub-menu for configuring Intel® Active Management Technology. *For more information on Intel® AMT, see http:/support.intel.com/technology/platform- technology/intel-amt/*
Change Intel® ME Password	Intel® ME password must be changed from the default password prior to gaining access to certain ME options. Intel® ME passwords must be between 8 and 32 characters long, have at least one upper case character, one lower case character, one number and a special character (for example: !, @, #, $, %, ^, &, *). *The default password, which is the same on all newly deployed systems, is **admin.** When you first enter the Intel MEBx using the default password, you must change the password before you can use any Intel MEBx features.* *If you forget the MEBx password, you will need to perform a BIOS Recovery and then reconfigure Intel® AMT.*

Refer to the following charts for descriptions and options for the MEBx settings.

Intel® ME Configuration

MEBx Menu	Setting	Options	Description / Purpose
Intel® ME Configuration	Intel® ME State Control	• Disabled • Enabled	The Intel Management Engine State Control (enable/disable) option provides a detach capability during field malfunction debug. You can use this option to disable the Intel Management Engine in order to isolate the Intel Management Engine subsystem from the main platform until the debugging process is complete. Intel Management Engine is not actually disabled via the Disable option. It is paused at a very early stage of the Intel Management Engine boot process so that the system has no traffic originating from the Intel Management Engine on any bus. This ensures that you can debug a system problem without interference from the Intel Management Engine.
Intel® ME Configuration	Intel® ME Firmware Local Update	• Disabled • Enabled	Intel ME Firmware Local Update provides the capability to allow or prevent firmware local update in the field. This local firmware update does not require an administrator user name and password. Therefore, once the local update is complete, this setting is automatically set to “Disabled” by the Intel ME firmware. This option must be set to “Enabled” when a local update is needed.
Intel® ME Configuration > Intel® ME Feature Control	Manageability Feature Selection	• None • Intel® AMT • ASF	The options available for this setting depend on your system configuration. ASF is for backward compatibility reasons only. So either choose “none” or “AMT” for using AMT capabilities.
Intel® ME Configuration > Intel® ME Feature Control	Intel® Quiet System Technology	• Disabled • Enabled	Enables or disables Intel® Quiet System Technology (IQST). IQST is intelligent system fan speed control algorithms that use operating temperature ranges more efficiently to reduce perceived system noise by minimizing fan speed changes.

Intel® AMT Configuration

MEBx Menu	Setting	Options	Description / Purpose
Intel® ME Configuration > Intel® ME Power Control	Intel® ME ON in Host Sleep States	• Desktop: ON in S0 • Desktop: On in S0, S3 • Desktop: ON in S0, S3, S4-5 • Desktop: ON in S0, ME WoL in S3 • Desktop: ON in S0, ME WoL in S3, S4-5 • Desktop: ON in S0, S3, S4-5, OFF After Power Loss • Desktop: ON in S0, ME WoL in S3, S4-5, OFF After Power Loss	The power package selected will determine when the Intel® Management Engine is turned ON. The default power package turns off the Intel Management Engine in all Sx (S3/S4/S5) states when the system is on AC power.
Intel® AMT Configuration	TCP/IP	Network Interface Enabled/Disabled	If Network Interface is enabled, the TCP/IP parameters can be configured. If it is disabled, TCP/IP is automatically configured to DHCP disabled mode with static IP 0.0.0.0.
Intel® AMT Configuration	TCP/IP	• DHCP Enabled/Disabled	Shows the current status of DHCP and allows you to enable or disable it.
Intel® AMT Configuration > TCP/IP	IP Address (only if DHCP is disabled)	User defined	Enter the address in dot-decimal notation.
Intel® AMT Configuration > TCP/IP	Subnet Mask (only if DHCP is disabled)	User defined	Enter the address in dot-decimal notation.
Intel® AMT Configuration > TCP/IP	Default Gateway Address (only if DHCP is disabled)	User defined	Enter the address in dot-decimal notation.
Intel® AMT Configuration > TCP/IP	Preferred DNS Address (only if DHCP is disabled)	User defined	Enter the address in dot-decimal notation.
Intel® AMT Configuration > TCP/IP	Alternate DNS Address (only if DHCP is disabled)	User defined	Enter the address in dot-decimal notation.
Intel® AMT Configuration > TCP/IP	Domain Name	User defined	Enter the client system domain name.

MEBx Menu	Setting	Options	Description / Purpose
Intel® AMT Configuration > TCP/IP	Provision Mode	Change to Intel®AMT1.0/ 3.0 Mode	Changes the Intel®AMT Mode. “AMT1.0” is for backward compatibility reasons only. So choose “AMT3.0” for using all AMT capabilities
Intel® AMT Configuration	Provision Model	• Enterprise • Small Business	Configures the provisioning mode. Enterprise mode supports both HTTP Digest and TLS security, however this mode requires a provisioning server to function. Small-Medium Business mode supports HTTP Digest only (no TLS support).
Intel® AMT Configuration > Setup and Configuration (only in Enterprise Provision Model)	Current Provisioning Mode	No changeable options	Displays the current provisioning TLS Mode: None, PKI, or PSK.
Intel® AMT Configuration > Setup and Configuration (only in Enterprise Provision Model)	Provisioning Record	No changeable options	Displays the provision PSK/PKI record data of system. If the data has not been entered, the MEBX will display a message that states “Provision Record not present”. If the data is entered, the Provision record will display details of the provisioning.
Intel® AMT Configuration > Setup and Configuration (only in Enterprise Provision Model)	Provisioning Server IP	User defined	Enter the address of the provisioning server in dot-decimal notation and the Port number.
Intel® AMT Configuration > Setup and Configuration > TLS PSK (only in Enterprise Provision Model)	Set PID and PPS	User defined	The PID is an 8 character alpha-numeric string in dash-separated format, e.g. ABCD-123K. The PPS is a 32 character alpha-numeric string in dash-separated format, e.g. EGET-GZFF-C6A6-ORRR-HQXP-C9JI-RJGB-KBS8.
Intel® AMT Configuration > Setup and Configuration > TLS PSK (only in Enterprise Provision Model)	Delete PID and PPS	Y / N	Deletes the PID and PPS. This will unprovision Standard Manageability

MEBx Menu	Setting	Options	Description / Purpose
Intel® AMT Configuration > Setup and Configuration > TLS PKI (only in Enterprise Provision Model)	Remote Configuration Enable/Disable	• Disabled • Enabled	Disables or enables Remote Configuration.
Intel® AMT Configuration > Setup and Configuration > TLS PKI (only in Enterprise Provision Model)	Manage Certificate Hashes (only if Remote Configuration is enabled)	User defined	Displays the list of hashes that are currently stored and the current status. You can add or delete certificates or change the active status of the certificates.
Intel® AMT Configuration > Setup and Configuration > TLS PKI (only in Enterprise Provision Model)	Set FQDN (only if Remote Configuration is enabled)	User defined	Sets the FQDN of the provisioning server.
Intel® AMT Configuration > Setup and Configuration > TLS PKI (only in Enterprise Provision Model)	Set PKI DNS Suffix (only if Remote Configuration is enabled)	User defined	Sets the PKI DNS suffix of the provisioning server.
Intel® AMT Configuration	Un-Provision	Y/N	The option allows the IT-admin to reset Intel® AMTconfiguration to factory defaults.
Intel® AMT Configuration	VLAN	• Disabled • Enabled	Select VLAN from the menu to enable or disable VLANs. This setting must match the VLAN settings configured in the operating system.
Intel® AMT Configuration > VLAN (only if VLAN is enabled)	VLAN ID	1 - 4094	The VLAN ID must entered here
Intel® AMT Configuration > SOL/IDE-R	User Name and Password	• Disabled • Enabled	This option provides the user authentication for SOL/IDER session. If Kerberos is used, this option should be set to DISALBED. The user authentication is through Kerberos. If Kerberos is not used, you can choose to enable or disable user authentication on SOL/IDE-R sessions.

MEBx Menu	Setting	Options	Description / Purpose
Intel® AMT Configuration > SOL/IDE-R	Serial Over LAN	• Disabled • Enabled	SOL allows console input/output on the Intel® AMT managed client to be redirected to the management server console.
Intel® AMT Configuration > SOL/IDE-R	IDE Redirection	• Disabled • Enabled	IDE-R allows the managed client to be booted from remote disk images on the management console.
Intel® AMT Configuration	Secure Firmware Update	• Disabled • Enabled	This option will allow the user to enable and disable secure firmware updates. Secure firmware updates require an administrator user name and password. If the administrator user name and password are not supplied, the firmware cannot be updated. When the secure firmware update feature is enabled, you can update the firmware using the secure method. Secure firmware updates will pass through the LMS driver. If secure and local firmware updates are disabled, enable them to allow the firmware updates.
Intel® AMT Configuration	Set PRTC	User defined	Enter the Protected Real Time Clock (PRTC) value in GMT (UTC) format (YYYY:MM:DD:HH:MM:SS). Valid date range is 1/1/2004 – 1/4/2021. Setting the PRTC value is used for virtually maintaining the PRTC during a power off (G3) state. This configuration will only be shown for Standard and Advanced Provisioning Model.
Intel® AMT Configuration	Idle Timeout	User defined	This setting is used to enable and disable Intel Management Engine WoL on LAN feature and define Intel Management Engine idle timeout in M1 state as well. Enter the value in minutes.

BIOS Setup

The H1-CPU-Desktop board is delivered with a Phoenix BIOS chip that contains the ROM Setup information of your system. This chip serves as an interface between the processor and the rest of the main boards components. This section explains the information contained in the Setup program and tells you how to modify the settings according to your system configuration.

Even if you are not prompted to use the Setup program, you might want to change the configuration of your system in the future. For example, you may want to enable the Security Password Feature or make changes to the power management settings. It will then be necessary to reconfigure your system using the BIOS Setup program so that the system can recognize these changes and record them in the CMOS RAM or the FLASH ROM. All setup data is stored in a non volatile memory (CMOS RAM). If you remove the CMOS battery, all parameters will be lost.

Standard BIOS Version

The BIOS ROM of the system holds the Setup utility. When you turn on the system, it will provide you with the opportunity to run this program. This appears during the Power-On Self Test (POST). Press <F2> to call the Setup utility. If you are a little bit late pressing the mentioned key, POST will continue with its test routines, thus preventing you from calling Setup. If you still need to call Setup, reset the system by pressing <Ctrl> + <Alt> + <Delete>. You can also restart by turning the system off and then on again. But do so only if the first method fails.

The Setup program has been designed to make it as easy as possible. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.

When you invoke Setup, the main program screen will appear. On the following pages you will read more information about the Setup entries.

Because the BIOS software is constantly being updated, the following BIOS screens and descriptions are for reference purposes only and may not reflect your BIOS screens exactly.

BIOS Menu Bar

The top of the screen has a menu bar with the following sections:

INFO	Use this menu for information only
MAIN	Use this menu to make changes to the basic system configuration.
ADVANCED	Use this menu to enable and make changes to the advanced features.
SECURITY	Use this menu to enable a supervisor password.
TPM State (Note1)	Use this menu to setup an optional TPM security module.
POWER	Use this menu to configure and enable Power Management features.
BOOT	Use this menu to configure the default system device used to locate and load the Operating System.
EXIT	Use this menu to exit the current menu or specify how to exit the Setup program.

Note1: This entry is available only, if optional TPM security module is mounted.

To access the menu bar items, press the right or left arrow key on the keyboard until the desired item is highlighted.

Legend Bar

At the bottom of the Setup screen you will notice a legend bar. The keys in the legend bar allow you to navigate through the various setup menus. The following table lists the keys found in the legend bar with their corresponding alternates and functions.

Navigation Key(s)	Description of Functions
<F1>	Displays the General Help screen from anywhere in the BIOS Setup.
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu.
← or → (keypad arrows)	Select the menu item to the left or right.
↑ or ↓ (keypad arrows)	Moves the highlight up or down between fields.
- (minus key)	Scrolls backward through the values for the highlighted field.
+ (plus key) or spacebar	Scrolls forward through the values for the highlighted field.
<Enter>	Brings up a selection menu for the highlighted field.
<Home> or <PgUp>	Moves the cursor to the first field.
<End> or <PgDn>	Moves the cursor to the last field.
<F9>	Loads the default configuration into Setup.
<F10>	Saves changes and exits Setup.

General Help

In addition to the Item Specific Help window, the BIOS setup program also provides a General Help screen. This screen can be called from any menu by simply pressing <F1> or the <Alt> + <H> combination. The General Help screen lists the legend keys with their corresponding alternates and functions.

Scroll Bar

When a scroll bar appears to the right of a help window, it indicates that there is more information to be displayed that will not fit in the window. Use <PgUp> and <PgDn> or the up and down keys to scroll through the entire help document.
Press <Home> to display the first page, press <End> to go to the last page.
To exit the help window, press <Enter> or <Esc>.

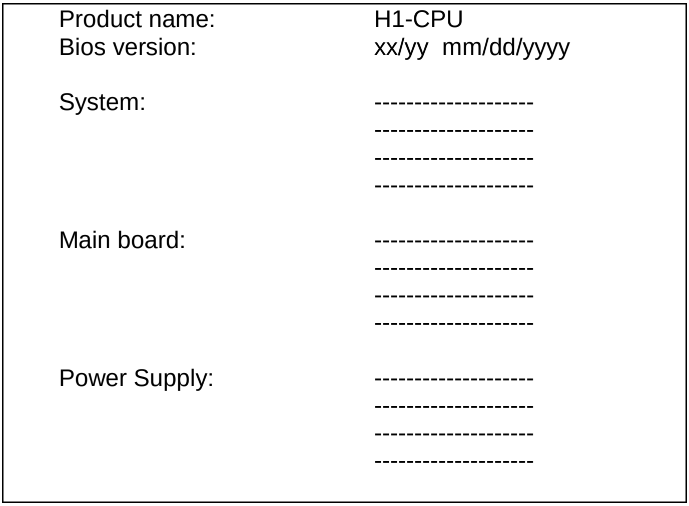
Sub-Menu

Note that a right pointer symbol appears to the left of certain fields. This pointer indicates that a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter.

To call a sub-menu, simply move the highlight to the field and press <Enter>. The sub-menu then will appear immediately. Use the legend keys to enter values and move from field to field within a sub-menu just as you would do within a menu. Use the <Esc> key to return to the main menu. Take some time to familiarize yourself with each of the legend keys and their corresponding functions. Practice navigating through the various menus and sub-menus. If you accidentally make unwanted changes to any of the fields, use the set default hot key <F9>. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right side of each menu. This window displays the help text for the currently highlighted field.

Info screen

When the Setup program is accessed, the following screen appears:



```
Product name:              H1-CPU
Bios version:              xx/yy  mm/dd/yyyy

System:                    --------------------
                           --------------------
                           --------------------
                           --------------------

Main board:                --------------------
                           --------------------
                           --------------------
                           --------------------

Power Supply:              --------------------
                           --------------------
                           --------------------
                           --------------------
```

This screen is for information only. There is nothing that could be changed within Setup.
All information is intended to facilitate the support of your system.

Product name:

This text is fixed for your H1-CPU-Desktop board with standard BIOS. This board is also called “H1-CPU”.

Bios version:

The Bios version is displayed in the release format xx/yy, followed by date of release in international format.

System, Main board, Power Supply:

The default placeholders may be replaced by specific data from factory, describing configuration, serial number etc. for each device.

Main Menu

```
              System Time:                    [08:14:46]
              System Date:                    [02/20/2009]


➢             IDE    Port 0                   [None]
➢             SATA Port 1                     120GB SATA1]
➢             SATA Port 2                     [None]
➢             SATA Port 3                     [None]
➢             SATA Port 4                     [None]

              Installed Memory                1024 MB
              Available to OS                 1023 MB
              Used by devices                 1 MB
```

System Time [XX: XX: XX]

Sets your system to the time that you specify (usually the current time). The format is hour, minute, second. Valid values for hour, minute, and second are: Hour: (00 to 23), Minute: (00 to 59), Second: (00 to 59). Use the <Tab> or <Shift> + <Tab> keys to move between the hour, minute, and second fields.

System Date [XX/XX/XXXX]

Sets your system to the date that you specify (usually the current date). The format is month, day, year. Valid values for month, day, and year are: Month: (1 to 12), Day (1 to 31), Year: (up to 2079).

Use the <Tab> or <Shift> + <Tab> keys to move between the month, day, and year fields.

IDE Port 0 / SATA Port 1-4

The line is info line about the attached P-ATA hard disks, while the next four lines are used for the S-ATA disks.

Note: Before attempting to configure a hard disk drive, make sure you have the configuration information supplied by the manufacturer of the drive. Incorrect settings my cause your system not to recognize the installed hard disk. To allow the BIOS to detect the drive type automatically, select [Auto].

```
Type:                              [Auto]

LBA Format
Total Sectors                      234441648
Maximum Capacity                   120GB SATA1

Multi-Sector Transfers:            [16 Sectors]
LBA Mode Control:                  [Enabled]
32 Bit I/O:                        [Disabled]
Transfer Mode:                     [Fast PIO 4 / DMA 2]
Ultra DMA Mode                     [Mode 5]
```

Type [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic detection is successful, the correct values will be filled in for the remaining fields on this sub-menu. If automatic detection fails, your hard disk drive may be too old or too new. You can try updating your BIOS or enter the IDE hard disk drive parameters manually.

After the IDE hard disk drive information has been entered into BIOS, new IDE hard disk drives must be partitioned (e.g. with FDISK) and then formatted before data can be read from and written to. Primary IDE hard disk drives must have its partition set to active (also possible with FDISK).

Other options for the Type field are: [None] [ATAPI Removable] [CD-ROM] [IDE Removable] [Other ATAPI]

Important: If your hard disk was already formatted on an older previous system, incorrect parameters may be detected. You will need to enter the correct parameters manually or use low-level format if you do not need the data stored on the hard disk. If the parameters listed differ from those used when the disk was formatted, the disk will not be readable. If the auto detected parameters do not match those that should be used for your disk you should enter the correct ones manually by setting [User].

[User]

Manually enter the number of cylinders, heads and sectors per track for your drive. Refer to your drive documentation or to the label on the drive. If no drive is installed or if you are removing a drive and not replacing it, select [None].

Cylinders

This field configures the number of cylinders. Refer to your drive documentation to determine the correct value to enter into this field.
To make changes to this field, the Type field must be set to [User].

Heads

This field configures the number of read/write heads. Refer to your drive documentation to determine the correct value to enter into this field.
To make changes to this field, the Type field must be set to [User].

Sector

This field configures the number of sectors per track. Refer to your drive documentation to determine the correct value to enter into this field.
To make changes to this field, the Type field must be set to [User].

Maximum Capacity

This field shows the drive's maximum capacity calculated automatically by the BIOS from the drive information you entered.

Multi-Sector Transfers [Maximum]

This option automatically sets the number of sectors per block to the highest number supported by the drive. This field can also be configured manually. Note that when this field is configured automatically, the value set may not always be the fastest value for the drive. Refer to the documentation that came with your hard drive to determine the optimal value and set it manually.
To make changes to this field, the Type field must be set to [User]. Configuration options: [Disabled] [2 Sectors] [4 Sectors] [8 Sectors] [16 Sectors].

LBA Mode Control [Enabled]

Select the hard disk drive type in this field. When Logical Block Addressing is enabled, 28-bit addressing of the hard drive is used without regard to cylinders, heads, or sectors. Note that Logical Block Access may decrease the access speed of the hard disk. However, LBA Mode is necessary for drives with more than 504MB of storage capacity. Configuration options: [Enabled] [Disabled].

32 Bit I/O [Disabled]

This field setting enables or disables the 32 Bit IDE data transfers. Configuration options: [Disabled] [Enabled].

Transfer Mode [Standard]

This option lets you set a PIO (Programmed Input/Output) mode for the IDE device.
Modes 0 trough 4 provide successively increased performance. Configuration options:
[Standard] [Fast PIO 1] [Fast PIO 2] [Fast PIO 3] [Fast PIO 4] [FPIO 3 / DMA 1] [FPIO 4 / DMA 2].
After using the legend keys to make your selections in this sub-menu, press the <Esc> key to exit back to the Main menu. When the Main menu appears, you will notice that the drive size is indicated in the field for the hard disk drive that you just configured.

Ultra DMA Mode [Disabled]

This option defines the speed for Ultra Direct Memory Access, an advanced protocol of PIO mode. It uses data transfer from IDE devices to memory independent from CPU support, thus increasing overall system performance. Configuration options:[Disabled] [Mode 0] [Mode 1] [Mode 2] [Mode 3] [Mode 4] [Mode 5]

Installed Memory: XXX MB

This field displays the amount of installed memory detected by the system during bootup. You do not need to make changes to this field. This is a display only field.

Available to OS: XXX MB

This field displays the amount of memory that is available to the Operating System. You do not need to make changes to this field. This is a display only field.

Used by devices: XXX MB

This field displays the amount of memory that is claimed by devices that need memory and reserve it from main memory. You do not need to make changes to this field. This is a display only field.

Advanced Menu

```
➢  Advanced Chipset Control
➢  I/O Device Configuration
➢  DMI Event Logging

   Reset Configuration Data:          [No]
   Speaker Volume                     [High]
   Video output to COM3:              [Disabled]
```

Advanced Chipset Control

```
➢    AMT Sub-Menu

     Default Primary Video Adapter        [IGD]
     IGD – Device 2:                      [Auto]
     IGD – Device 2, Function 1:          [Auto]
        DVMT 3.0 Mode                     [Auto]
        Pre-Allocated Memory Size:        [8MB]
        Total Graphics Memory:            [Turbo]
        DVMT Graphics Memory:             216MB

     Azalia Audio                         [Auto]

     USB 2.0 Support                      [Enabled]
```

AMT Sub-Menu

This Menu is for information only. It displays the actual status of Intel® Active Management Technology (AMT). In addition you can find here the programmed value for the Host MAC Address and the Dedicated MAC Address.

Default Primary Video Adapter [IGD]

Select IGD to have Internal Graphics Device, if supported and enabled, to be used as boot display device. Select PCI to have PCI Graphics to be used for the boot display.
Configuration options:[IGD] [PCI].

IGD – Memory Size [MaxDVMT]

Select the amount of Main Memory that the Internal Graphics Device will use. MaxDVMT will use as much as possible. Other options: [128MB] [256MB]

DVMT Graphics Memory

This entry is an info field to show the amount of memory that the Dynamic Video Memory Technology (DVMT) is using from the main memory

OnBoard GBE LAN [Enabled]

Select the GigaBitEthernetController to be used or not. Other option [Disabled]

OnBoard LAN BootRom

Select the OnBoard LAN Boot option to be used or not. Other option [Disabled]

Azalia Audio [Auto]

Setting item to Auto will allow the onboard audio to operate properly. Setting item to disabled will remove the onboard audio controller from PCI config space.
Configuration options:[Disabled] [Auto].

Hard Disk Pre-Delay [3 Seconds]

Hard Disks need different time after power on to be ready for initializing by BIOS. For some Disks we have to wait longer before trying to access them, thus extending the time needed for booting the system. If you encounter waiting additional 3 seconds will not be enough to recognize your Hard Disks, you may increase Pre-Delay. On the other hand it may be possible to disable Pre-delay to speed up boot process. Configuration options: [Disabled] [3 Seconds] [6 Seconds] [9 Seconds] [12 Seconds] [15 Seconds] [21 Seconds] [30 Seconds]

I/O Device Configuration

```
Serial port A:                        [Enabled]
  Base I/O address/IRQ:               [3F8/IRQ 4]
Serial port B:                        [Enabled]
  Base I/O address/IRQ:               [2F8/IRQ 3]
Parallel port:                        [Enabled]
 Mode:                                [Bi-directional]
 Base I/O address:                    [378]

Touch Screen Routing:                 [TFT Touch to COM2]
```

Serial port A [Enabled], Serial port B [Enabled]

These fields configure the Serial ports directly. Configuration options: [Disabled] [Enabled].

Base I/O address/IRQ

Set the base I/O address and interrupt line for the onboard serial connector..
Configuration options: [3F8/IRQ 4] [3E8/IRQ 4] [2F8/IRQ 3] [2E8/IRQ 3].

Parallel port [Enabled]

These field configures the Parallel port directly. Configuration options: [Disabled] [Enabled].

Mode [Bi-directional]

This field lets you select the operating mode of Parallel port. Configuration options: [Bi-directional] [EPP] [ECP] [EPP & ECP]

Base I/O address

Set the base I/O address parallel connector.
Configuration options: [378] [278] [3BC]

Touch Screen Routing [TFT Touch to COM2]

Using a Touch Screen you may select routing it to a serial interface using hardware lines instead of COM1 or COM2.
Configuration Options: [No Routing] [TFT Touch to COM1] [TFT Touch to COM2] [. PCI Touch to COM1] [PCI Touch to COM2] [TFT&PCI to COM(1&2)].
[TFT&PCI to COM(1&2)] means: TFT will be routet to COM1, PCI will be routet to COM2.

DMI Event Logging

Event log validity	Valid
Event log capacity	Space available
View DMI event log	[Enter]
Event Logging	[Enabled]
Mark DMI events as read	[Enter]
Clear all DMI event logs	[No]

Desktop Management Interface (DMI) is a method of managing computers in an enterprise. Using DMI, a system administrator can obtain the types, capabilities, operational status, installation date
and other information about the system components. An event log is a fixed-length area within a non-volatile storage element.

View DMI event log [Enter]

This setup point is useful to display the recorded DMI events like a defect floppy disk controller or anything else. If there is an error stored, the BIOS will display a message every time the system is starting up.

Event logging [Enabled]

If you do not use the DMI event logging, it is possible to shut off the recording mechanism of errors.

Mark DMI events as read [Enter]

If you dislike the BIOS message at system starting up but you like to have the errors recorded, mark all DMI events as read. With the next start up of the system, the BIOS would not display a message.

Clear all DMI event logs [No]

With this point it is possible to clear all the recorded DMI events manually.

Reset Configuration Data [No]

[Yes] erases all configuration data in a section of memory for ESCD (Extended System Configuration Data) which stores the configuration settings for non-PnP Plug-in devices. Configuration options: [No] [Yes]
If you are facing problems after adding or removing any hardware components to the system it might be wise to select the [Yes] option once. This allows the BIOS to reconfigure available hardware resources.

Speaker Volume [High]

This field is for the volume control of the installed speaker. Configuration options [High] [Middle] [Low].

Video output to COM3 [Disabled]

Some systems may be configured without a full screen display, just using a small display connected to the COM3 serial port. [Enabled] will redirect diagnostic information during PowerOnSelfTest to this serial port, giving control about the system to smaller displays as well.

Security Menu

Supervisor Password Is:	Clear
Set Supervisor Password	[Enter]

Set Supervisor Password

This field allows you to set the password. Highlight the field and press <Enter>.
Type a password and press <Enter>, you can type up to eight alphanumeric characters. Symbols and other characters are ignored. To confirm the password, type the password again and press <Enter>. The password is now set to [Enabled]. This password allows full access to the BIOS Setup menu.
To clear the password, highlight this field and press <Enter>. The same dialog box as above will appear. Press <Enter> and the password will be set to [Disabled].

TPM State Menu

Current TPM State:	Enabled and Activated
Change TPM State	[No Change]

Current TPM State:

This is field informs about the actual state of the TPM module.

Change TPM State: [No Change]

Select the TPM changes after the next automated reboot of the system.

- [No Change]: The TPM state will be untouched.
- [Enable & Activate]: This action will switch on the TPM logical.
- [Deactivate & Disable]: This action will switch off the TPM logical. WARNING! Doing so might prevent security applications that rely on the TPM from functioning as expected.
- [Clear]: WARNING! Clearing erases information stored on the TPM. You will lose all created keys and access to data encrypted by these keys. After clearing the TPM, it will get the status deactivated & disabled.

Power Menu

The Power menu allows you to define systems power issues and check systems health.

After Power Failure:	[Stay Off]
Standby Power	[Enabled]
Wake On Modem Ring:	[Disabled]
Wake On Time:	[Disabled]
➢ Hardware Monitor:	

After Power Failure [Stay off]

Select whether you want your system to be rebooted after power has been interrupted. [Stay off] leaves your system off and [Restore] reboots your system if it was active before power loss. Is the key [Follow AC/Power] selected, the system will startup anytime power is available. Configuration options: [Stay off] [Restore] [Follow AC/Power].
In mode [Follow AC/Power] the front button is disabled. This means that there is no way to force down the system pressing the front button more than 4 seconds, avoiding accidental shutdown.

Standby Power [Enabled]

You may select to power some devices during Standby- oder Hibernate-Mode, to enable them to wake up the system. If enabled, the PS/2 connector and the onboard rear USB connectors are connected to 5V-Standby power. Configuration options: [Disabled] [Enabled].

Wake-on Modes

Please note that you have to shut down the system in power saving modes by OS before you can use Wake-on modes. Switching off the system by mainpower switch or frontbutton-override will not initialize system wakeup functions. See following table, which wakeup events are available from different power states:

	Standby (S3)	Hibernate (S4)	Soft off (S5)
Front Button	Yes	Yes	Yes
LAN	Yes	Yes	Yes
Modem (Note1)	Yes	Yes	Yes
Time (Note1, 2)	Yes	Yes	Yes
PS/2 (Note3)	Yes	Yes	No
USB (Note3)	Yes	Yes	No

Note1: “Yes” is valid only, if the option is [Enabled].
Note2: If Wake on Time is enabled, you can not use “planned tasks” from WinXP.
Selected Bios wakeup time would override planned OS time.
Note 3: “Yes” is valid only, if Standby Power is [Enabled].

Wake-On-Modem Ring [Disabled]

This allows to enable or disable powering up the BEETLE when the modem receives a call while the BEETLE is in Soft-Off, Hibernate or Standby mode.
NOTE: The BEETLE cannot receive or transmit data until the system and applications are fully running, thus connection cannot be made on the first try. Turning an external modem off and then back on while the BEETLE is off causes an initialization string that will cause the system to power on.
Configuration options: [Disabled] [Enabled].

Wake-On-Time [Disabled]

This allows an unattended or automatic system power up from Soft-Off, Hibernate or Standby mode. You may configure your system to power up at a certain time. The wake-up time is to be set in the next field below this field. Please note, if Wake on Time is enabled, you can not use “planned tasks” from WinXP Configuration options: [Disabled] [Enabled]

Hardware Monitor

```
CPU Temperature:                 42 ˚C
Board Temperature:               35 ˚C

CPU-Fan                          4448 rpm
System-Fan                       5480 rpm
PowerSupply-Fan                  2790 rpm

Core Voltage                       1.26 V
+1.8V    Voltage                   1.82 V
+3.3V    Voltage                   3.39 V
+VCC     Voltage                   5.26 V
+12V     Voltage                  12.48 V
-12V     Voltage                  12.03 V
+1.5V    Voltage                   1.48 V
+5VSB    Voltage                   5.18 V
 VBat    Voltage                   3.0 V
```

CPU Temperature [xx °C]

The onboard hardware monitor is able to detect the motherboard and CPU temperatures (for supported processors only).

CPU-Fan Speed [xxxx rpm]
System-Fan Speed [xxxx rpm]
PowerSupply-Fan Speed [xxxx rpm]

The onboard hardware monitor is able to detect the speed of fans in rotations per minute (rpm). The presence of the fans is automatically detected.

Several Voltages [xx.x V]

The onboard hardware monitor is able to detect the voltage output by the onboard voltage regulators.

Boot Menu

```
    Boot  priority order:
      1:  USB FDC:
      2:  USB CDROM :
      3:  IDE CD :
      4:  USB HDD :
      5:  IDE 0 :
      6:  SATA1 :
      7:  SATA 2 :
      8:  PCI LAN :
Excluded  from boot order
       :  not available:
       :  SATA3 :
       :  SATA4 :
       :  USB KEY :
       :  USB ZIP:
       :  PCI SCSI
       :  Other USB :
       :  PCI :
       :  Legacy Network Card:
       :  UNKNOWN:
```

The Boot menu allows you to select from the four possible types of boot devices listed using the up and down arrow keys. By using the <+> or <Space> key, you can promote devices and by using
the <-> key, you can demote devices. Promotion or demotion of devices alters the priority which the system uses to search for a boot device on system power up.

Exit Menu

```
Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
```

Once you have made all your selections from the various menus in the Setup program, you should save your changes and exit Setup. Select Exit from the menu bar to display the following menu.
<Esc> does not exit this menu. You must select one of the options from this menu or <F10> from the legend bar to exit this menu.

Exit Saving Changes

Once you have finished making selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the BEETLE is turned off. Once this option is selected, a confirmation is asked. Select [Yes] to save changes and exit.

Exit Discarding Changes

This option should only be used if you do not want to save the changes you have made to the Setup program. If you have made changes to fields other than system date, system time, and password, the system will ask for confirmation before exiting.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menu. When this option is selected or if <F9> is pressed, a confirmation is requested. Select [Yes] to load default values. You can now select Exit Saving Changes or make other changes before saving the values to the non-volatile RAM.

Discard Changes

This option allows you to discard the selections you made and restore the values you previously saved. After selecting this option, a confirmation is requested. Select [Yes] to discard an changes and load the previously saved values.

Test Points Codes

At the beginning of each POST routine, the BIOS outputs the test point error code to I/O port address 80h. Use this code during trouble shooting to establish where the system failed and what routine has been performed.

If the BIOS detects a terminal error condition, it halts POST after issuing a terminal error beep code and attempting to display the error code on the port 80h LED display (diagnostic card). If the system hangs before the BIOS can process the error, the value displayed at the port 80h is the last test performed. In this case, the screen does not display the error code.

The routine derives the beep code from the test point error as follows:

1. The 8-bit error code is broken down to four 2-bit groups.
2. Each group is made one-based (1 through 4) by adding 1.
3. Short beeps are generated for the number in each group.

Example:
Test point 1Ah = 00 01 10 10 = 1-2-3-3 beeps

The following is a list of the checkpoint codes written out to the diagnostic port at the start of each test.
The first beep code inside of the BIOS has 1-long and 2-short beeps. This means that there is a problem with the graphic adapter.

POST Code (Hex)	**Name**	**Description**

02h	VERIFY_REAL	IF <in port mode> THEN
		Turn on A20
		Reset Processor
		ENDIF

03h	DISABLE_NMI	Disable non-maskable Interrupts
04h	GET_CPU_TYPE	IF <cold boot> THEN Store reset DX value in CMOS Determine CPU manufacturer and type Store CPU manufacturer and type in CMOS ENDIF
06h	HW_INIT	Reset all DMA controllers. Disable all video controllers. Clear any pending interrupts from the RTC Set up port 61h to speaker off and timer gate enabled.
08h	CS_INIT	Set DRAM controller registers to values that are needed for DRAM discovery and testing.
09h	SET_IN_POST	Set bit in CMOS indicating that POST is in progress. Not cleared until Post Code Aeh.
0Ah	CPU_INIT	Set CPU configuration registers.
0Bh	CPU_CACHE_ON	Turns on the CPU cache.
0Ch	CACHE_INIT	Set L2 cache controller registers to values needed for SRAM discovery and testing.

0Eh	IO_INIT	IF <onboard super I/O exists> THEN
		Turn Off LPT and COM ports in super I/O.
		Set I/O controller registers to default values.
		ENDIF

0Fh	FDISK_INIT	IF <secondary IDE controllers exists> THEN
		Set secondary IDE controller configuration registers to default values.
		ENDIF

10h	PM_INIT	IF <power management enabled> THEN
		Set the power management configuration registers to default values.
		ENDIF

11h	REG_INIT	Set Cx5520 configuration registers to default values. Set any other configuration registers to default values.

12h	RESTORE_CR0	Return to real mode.
13h	PCI_BM_RESET	Early reset of PCI devices required to disable bus masters. Assumes the presence of a stack and running from decompressed shadow memory.
14h	8742_INIT	Verify 8742 (keyboard controller) is responding. Improper connections/timing to the 8742. Send self test command to 8742.

16h	CHECKSUM	Checksum the system BIOS ROM
		IF <checksum is incorrect> THEN
		Halt.
		ENDIF

17h	PRE_SIZE_RAM	Initialize external cache before autosizing memory.
18h	TIMER_INIT	Initialize all three of the 8254 timers.
1Ah	DMA_INIT	Initialize the DMA command register and all 8 DMA channels.
1Ch	RESET_PIC	Initialize the 8259 interrupt controller.

20h	REFRESH	Copy test code to RAM and execute that code looking for refresh bit in port 61h to toggle.
		IF <refresh test failed> THEN
		Halt.
		ENDIF

22h	8742_TEST	Read 8742 self-test results. IF <self-test failed> THEN Halt. ELSE Read system info from 8742 Set 8742 command byte. ENDIF
24h	SET_HUGE_ES	Go into protected mode. Set ES, DS, SS, FS, and GS to 4Gb.
28h	SIZE_RAM	Determine the size of each DRAM bank. Set DRAM controller configuration registers to enable DRAM.
29h	MEM_MGR_INIT	Initialize the POST Memory manager.
2Ah	ZERO_BASE_RAM	Clear the 512k of DRAM.

2Ch	ADDR_TEST	Test for stuck address line in lower 1M of address space,
		IF <test failed> THEN
		Halt.
		ENDIF

POST Code (Hex)	Name	Description

2Eh	BASERAML	Test for stuck DRAM data line by walking a 1 through all bit locations of address 0 and then walking a 0 through.
		IF <test failed> THEN
		    Halt.
		ENDIF

2Fh	PRE_SYS_SHADOW	Clears the cache before shadowing the system.
32h	COMPUTE_SPEED	Determine the CPU core speed by timing the execution of a loop.
33h	PDM_INIT	Initialize the Phoenix Dispatch Manager.

34h	CMOS_TEST	Clear CMOS diagnostic byte.
		IF <CMOS battery is dead> THEN
		    Set “bad battery” flag in CMOS
		IF <CMOS checksum is bad> THEN
		    Set “bad CMOS check” flag in CMOS
		Checksum CMOS
		ENDIF
		ENDIF

36h	CHK_SHUTDOWN	Vector to proper shutdown routine (reset).
38h	SYS_SHADOW	Copy system BIOS ROM to shadow RAM.
3Ah	CACHE_AUTO	Detect the amount of SRAM for the L2 cache. Set L2 cache controller configuration registers to enable SRAM.
3Ch	ADV_CS_CONFIG	IF <CMOS is valid (checksum good and battery good) THEN Load DRAM controller configuration registers with values from CMOS fields. ENDIF

3Dh	ADV_REG_CONFIG	IF <CMOS is valid> THEN
		    Load ISA controller configuration registers with values from CMOS fields and load any other configuration registers with values from CMOS fields.
		ENDIF

42h	VECTOR_INIT	Set interrupt vectors 0-77h to BIOS general interrupt handler.
44h	SET_BIOS_INT	Set interrupt vectors 0-20h to correct BIOS interrupt handlers.
45h	CORE_DEVICE_INIT	Initialize all motherboard devices.
46h	COPYRIGHT	Verify that the Phoenix BIOS copyright message is correct.
47h	PCI_OP_INIT	Initialize PCI option ROM manager.
48h	CONFIG	Determine video type to be used and store.

POST Code (Hex)	Name	Description
49h	PCI_INIT	Initialize PCI to PCI bridges. Reset all PCI devices. Send self test command to all PCI devices. Configure base registers of all PCI devices.
4Ah	VIDEO	Initialize all MDA video adapters. Initialize all CGA video adapters. Execute VGA option ROMs to initialize VGA adapter. Initialize VSA.
4Bh	QUIETBOOT_START	Initialize Quietboot if installed. Enable IRQ0 and IRQ1.

4Ch	VID_SHADOW	IF <video shadow enabled in setup> THEN
		    IF <CMOS valid and last boot successful> THEN
		        Shadow video BIOS ROM.
		    ENDIF
		ENDIF

4Eh	CR_DISPLAY	Display the CPU type and speed on the screen.

51h	EISA_INIT	IF <EISA support is enabled> THEN
		    Checksum EISA data NVRAM locations.
		    IF <checksum good> THEN
		        Initialize each slot.
		    ELSE
		        Display bad config message.
		    ENDIF
		ENDIF

52h	KB_TEST	Check for return code of AA from keyboard self-test,
		IF <return code not AA> THEN
		    Set keyboard error flag
		ENDIF

54h	KEY_CLICK	IF <keyclick enabled and keyboard good> THEN Initialize key stroke clicker ENDIF
56h	ENABLE_KB	Send command to keyboard controller to enable the keyboard.
58h	HOT_INT	Check for unexpected interrupts. Check for unexpected NMI. Enable parity checkers and check for unexpected NMI.
59h	PDS_INIT	Register POST display services with POST Dispatch Manager.
5Bh	CPU_CACHE_OFF	Disable and WB invalidate CPU cache.

POST Code (Hex)	Name	Description
5Ch	MEMORY_TEST	Determine amount of memory below 1M. Walk a1 through data bus at 80000h. walk a 0 through data bus at 80000h. Check for stuck address line from 80000h to 8FFFFh.
60h	EXT_MEMORY	Determine total amount of memory by doing a read/write test. For each 1M block oh memory: Walk a 1 through data bus at first location of block. Walk a 0 through data bus at first location of block. Check for stuck address line in the block.
62h	EXT_ADDR	Do an extended address line test on the entire memory range.
64h	USERPATCH	Code that is patched into the ROM can be set up to execute at this point.
66h	CACHE_ADVNCD	Load L2 cache controller configuration registers with values from setup screens.
68h	CACHE_CONFIG	Set non-cacheable regions. Enable L1 and L2 caches.

6AH	DISP_CACHE	IF <cache RAM size not zero> THEN
		    Display L2 cache RAM size on screen.
		ENDIF

6Ch	DISP_SHADOW	IF <system BIOS ROM shadowed> THEN
		    Display message indicating that the system
		BIOS
		    ROM is shadowed.
		ENDIF
		IF <video BIOS ROM shadowed> THEN
		    Display message indicating that the video BIOS
		    ROM is shadowed.
		ENDIF

6Eh	DISP_NONDISP	Display the starting address of the no disposable (run time) BIOS.
70h	ERROR_MSGS	Display error messages for any errors found.

72h	TEST_CONFIG	IF <system configuration error found> THEN
		    Display message indicating configuration error
		    detected.
		ENDIF

74h	RTC_TEST	Verify that the RTC is running.
		IF <RTC not running> THEN
		    Set bit in RTC indicating that the time is invalid.
		ENDIF

POST Code (Hex)	Name	Description

76h	KEYBOARD	IF <keyboard failure detected> THEN
		Display message indicating keyboard failure.
		ENDIF

7Ch	HW_INTS	Initialize hardware interrupt vectors 08h-0Fh
7Dh	ISM_INIT	Initialize Intelligent System Monitoring Support.

80h	IO_BEFORE	IF <integrated super I/O exists> THEN
		Disable LPT and COM ports on integrated super
		I/O.
		ENDIF.

81h	CORE_LATE_INIT	Late initialization of devices.
82h	RS232	Identify and test all COM ports.
83h	CONFIG_IDE	Configure Fdisk controller.
84h	LPT	Test and ID parallel ports.
85h	PCI_PCC	Initialize PnP ISA devices.
87h	POST_CONFIG_MCD	Initialize Mother Board Configurable devices.
88h	BIOS_INIT	Initialize timeouts, key buffer, soft reset flag.
89h	ENABLE_NMI	Enable NMI.
8Ah	INIT_EXT_BDA	Initialize the extended BIOS data area.

8Bh	MOUSE	IF <mouse support enabled> THEN
		Setup interrupt vector for mouse.
		Add mouse support to equipment installed flag.
		ENDIF

8Ch	FLOPPY	Test both floppy drives.
		IF <error detected> THEN
		Display floppy error message.
		ENDIF

8Fh	FDISK_FAST_PREINIT	Count and store the number of ATA drives in the subsystem.

90h	FDISK	Initialize the hard disk subsystem and test.
		IF <error detected> THEN
		Display hard disk error message.
		ENDIF

91h	FDISK_FAST_INIT	Set timing based on drives attached.

POST Code (Hex)	Name	Description
92h	USERPATCH2	Code that is patched into the ROM can be setup to execute at this point.
93h	MP_INIT	Create the CPU feature table.
94h	DISABLE_A20	Disable the A20 address line.
95h	CD	Validate bootable CD ROM. Prepare CD for CD ROM boot.
96h	CLEAR_HUGE_ES	Store an 8 in the shutdown code byte in CMOS. Reset the processor.
97h	MP_FIXUP	Create pointer to MP table in Extended BDA.
98h	ROM_SCAN	Scan through the ISA option ROM space and jump to each option ROM found. Shadow PCI option ROMs and initialize cards.
9Ah	MISC_SHADOW	Shadow expansion ROM areas that are enabled from setup.
9Ch	PM_SETUP	Setup power management if enabled.
9Dh	SECURITY	Initialize Security Engine.
9Eh	IRQS	Enable IRQ 0, 1, 2, and 6.
9Fh	FDISK_FAST_INIT2	Check and store the total number of Fast Disks (ATA and SCSI).
A0h	TIME_OF_DAY	Verify that the system clock interrupts are occuring.

A2h	KEYBOARD_TEST	Set NumLock indicator.
		IF <keylock set> THEN
		    Print error message on screen.
		ENDIF

A4h	KEY_RATE	Initialize keyboard typematic rate.

AAh	SCAN_FOR_F2	IF <2 key was pressed during POST> THEN
		    Set flag indicating key press.
		    Display “Entering Setup” message.
		ENDIF

ACh	SETUP_CHECK	IF <2 was pressed> THEN
		    Enter Setup.
		ELSE IF <errors were found> THEN
		    Display “Press 7 or 2” prompt.
		IF <2 is pressed> THEN
		    Enter Setup.
		ELSE IF <7 is pressed> THEN
		    Boot.
		ENDIF
		ELSE
		    Boot.
		ENDIF

AEh	CLEAR_BOOT	Clear CMOS bit indicating POST is in progress.

POST Code (Hex)	Name	Description

B0h	ERROR_CHECK	IF <error were found> THEN
		    Beep twice.
		    Display “Press 7 or 2” message.
		IF <2 is pressed> THEN
		    Enter Setup.
		ELSE IF <7 is pressed> THEN
		    Boot.
		ENDIF
		ENDIF

B2h	POST_DONE	Change BIOS data areas flag to indicate POST is complete.
B4h	ONE_BEEP	Beep once.
B5h	QUIETBOOT_END	Reset video: Clear screen, reset cursor, reload DAC.

B6h	PASSWORD	IF <password enabled> THEN
		    Print message requesting password.
		IF <password incorrect> THEN
		    Halt.
		ENDIF
		ENDIF

B8h	SYSTEM_INIT	Clear the GDT.
B9h	PREPARE_BOOT	Prepare to boot, clear the screen.
BAh	DMI	Initialize DMI header and substructures.
C0h	INT19	Do INT 19h to load OS.

Additional Test points codes

These test points are only available if memory malfunction occured.

POST Code [Hex]	Description
E0h	Unsupported RAM detected / No RAM installed
E1h – EFh	RAM specification not valid

Abbreviations

ACPI	Advanced Configuration and Power Interface
AGTL+	Assisted Gunning Transceiver Logic
AMT	Active Management Technology
ASF	Advanced Systems Format
ATA	AT Attachment
BIOS	Basic Input and Output System
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
CRT	Cathode-ray Tube
DIMM	Dual Inline Memory Module
DMA	Direct Memory Access
DMI	Desktop Management Interface
DVMT	Dynamic Video Memory Technology
DVI	Digital Video Interface
ECP	Extended Capabilities Port
ESCD	Extended System Configuration Data
EPP	Enhanced Parallel Port
FSB	Front Side Bus
FQDN	Fully Qualified Domain Name
IDE	Integrated Drive Electronics
IGD	Internal Graphic Device
LAN	Local Area Network
LBA	Logical Block Addressing
LCD	Liquid Crystal Display
MAC	Media Access Control
ME	Management Engine
NVRAM	Non-volatile Random Access Memory
P-ATA	Parallel AT Attachment (old version of hard disk interface)
POS	Point of Sales
PCI	Peripheral Component Interconnect
PnP	Plug and Play
POST	Power On Self Test
QST	Quiet System Technology
ROM	Read Only Memory
SATA	Serial AT Attachment (new version of hard disk interface)
SLP	System Locked Pre-Installation
SMM	System Management Mode
TFT	Thin-film transistor
TPM	Trusted Platform Module
USB	Universal Serial Bus
VGA	Video Graphics Array

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